

# ABSTRACT

Precision inphase/quadrature up-down converter structures generally neither requiring trimming at the time of fabrication nor calibration during use. The converters use four mixers arranged to down convert to provide  $Q$ ,  $I$ ,  $\bar{I}$  and  $\bar{Q}$  baseband signals (or up convert  $Q$ ,  $I$ ,  $\bar{I}$  and  $\bar{Q}$  baseband signals), the combination of which signals has a very substantially reduced unwanted image frequency content. The use of an increased number of mixers in effect shifts the primary errors from absolute gain and phase errors, to gain and phase error mismatches between elements in replicated circuits, which mismatches can be held to a minimum in circuits replicated in a single integrated circuit.